

IBM BladeCenter Layer 2-7 GbE Switch
Module



Installation Guide

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Module



Installation Guide

Note:

Before using this information and the product it supports, read the *Warranty Information* document, the general information in Appendix B, “Notices,” on page 31, and the *Important Notices* document that comes with the product. Read the *IBM System Safety Notices* and the *License Agreement for Machine Code (LAMC)* document on the IBM Documentation CD. Read the *Environmental Notices and User Guide* on the IBM *Environmental Notices* CD.

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Safety

Before installing this product, read the Safety Information.

قبل تركيب هذا المنتج، يجب قراءة الملاحظات الأمنية

Antes de instalar este produto, leia as Informações de Segurança.

在安裝本产品之前，请仔细阅读 **Safety Information**
(安全信息)。

安裝本產品之前，請先閱讀「安全資訊」。

Prije instalacije ovog produkta obavezno pročitajte Sigurnosne Upute.

Před instalací tohoto produktu si přečtěte příručku bezpečnostních instrukcí.

Læs sikkerhedsforskrifterne, før du installerer dette produkt.

Lees voordat u dit product installeert eerst de veiligheidsvoorschriften.

Ennen kuin asennat tämän tuotteen, lue turvaohjeet kohdasta Safety Information.

Avant d'installer ce produit, lisez les consignes de sécurité.

Vor der Installation dieses Produkts die Sicherheitshinweise lesen.

Πριν εγκαταστήσετε το προϊόν αυτό, διαβάστε τις πληροφορίες ασφάλειας (safety information).

לפני שתתקינו מוצר זה, קראו את הוראות הבטיחות.

A termék telepítése előtt olvassa el a Biztonsági előírásokat!

Prima di installare questo prodotto, leggere le Informazioni sulla Sicurezza.

製品の設置の前に、安全情報をお読みください。

본 제품을 설치하기 전에 안전 정보를 읽으십시오.

Пред да се инсталира овој продукт, прочитајте информацијата за безбедност.

Les sikkerhetsinformasjonen (Safety Information) før du installerer dette produktet.

Przed zainstalowaniem tego produktu, należy zapoznać się z książką "Informacje dotyczące bezpieczeństwa" (Safety Information).

Antes de instalar este produto, leia as Informações sobre Segurança.

Перед установкой продукта прочтите инструкции по технике безопасности.

Pred inštaláciou tohto zariadenia si pečítajte Bezpečnostné predpisy.

Pred namestitvijo tega proizvoda preberite Varnostne informacije.

Antes de instalar este producto, lea la información de seguridad.

Läs säkerhetsinformationen innan du installerar den här produkten.

Important:

All caution and danger statements in this documentation begin with a number. This number is used to cross reference an English caution or danger statement with translated versions of the caution or danger statement in the *IBM Systems Safety Notices* book.

For example, if a caution statement begins with a number 1, translations for that caution statement appear in the *IBM Systems Safety Notices* book under statement 1.

Be sure to read all caution and danger statements in this documentation before performing the instructions. Read any additional safety information that comes with your server or optional device before you install the device.

Statement 1:



DANGER

Electrical current from power, telephone, and communication cables is hazardous.

To avoid a shock hazard:

- Do not connect or disconnect any cables or perform installation, maintenance, or reconfiguration of this product during an electrical storm.
- Connect all power cords to a properly wired and grounded electrical outlet.
- Connect to properly wired outlets any equipment that will be attached to this product.
- When possible, use one hand only to connect or disconnect signal cables.
- Never turn on any equipment when there is evidence of fire, water, or structural damage.
- Disconnect the attached power cords, telecommunications systems, networks, and modems before you open the device covers, unless instructed otherwise in the installation and configuration procedures.
- Connect and disconnect cables as described in the following table when installing, moving, or opening covers on this product or attached devices.

To Connect:

1. Turn everything OFF.
2. First, attach all cables to devices.
3. Attach signal cables to connectors.
4. Attach power cords to outlet.
5. Turn device ON.

To Disconnect:

1. Turn everything OFF.
2. First, remove power cords from outlet.
3. Remove signal cables from connectors.
4. Remove all cables from devices.

Statement 2:



CAUTION:

When replacing the lithium battery, use only IBM Part Number 33F8354 or an equivalent type battery recommended by the manufacturer. If your system has a module containing a lithium battery, replace it only with the same module type made by the same manufacturer. The battery contains lithium and can explode if not properly used, handled, or disposed of.

Do not:

- Throw or immerse into water
- Heat to more than 100°C (212°F)
- Repair or disassemble

Dispose of the battery as required by local ordinances or regulations.

Statement 3:



CAUTION:

When laser products (such as CD-ROMs, DVD drives, fiber optic devices, or transmitters) are installed, note the following:

- Do not remove the covers. Removing the covers of the laser product could result in exposure to hazardous laser radiation. There are no serviceable parts inside the device.
- Use of controls or adjustments or performance of procedures other than those specified herein might result in hazardous radiation exposure.



DANGER

Some laser products contain an embedded Class 3A or Class 3B laser diode. Note the following.

Laser radiation when open. Do not stare into the beam, do not view directly with optical instruments, and avoid direct exposure to the beam.



Class 1 Laser Product
Laser Klasse 1
Laser Klass 1
Luokan 1 Laserlaitte
Appareil À Laser de Classe 1

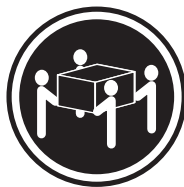
Statement 4:



≥ 18 kg (39.7 lb)



≥ 32 kg (70.5 lb)



≥ 55 kg (121.2 lb)

CAUTION:
Use safe practices when lifting.

Statement 5:



CAUTION:
The power control button on the device and the power switch on the power supply do not turn off the electrical current supplied to the device. The device also might have more than one power cord. To remove all electrical current from the device, ensure that all power cords are disconnected from the power source.



Statement 6:



CAUTION:

If you install a strain-relief bracket option over the end of the power cord that is connected to the device, you must connect the other end of the power cord to an easily accessible power source.

Statement 8:



CAUTION:

Never remove the cover on a power supply or any part that has the following label attached.



Hazardous voltage, current, and energy levels are present inside any component that has this label attached. There are no serviceable parts inside these components. If you suspect a problem with one of these parts, contact a service technician.

Statement 13:



DANGER

Overloading a branch circuit is potentially a fire hazard and a shock hazard under certain conditions. To avoid these hazards, ensure that your system electrical requirements do not exceed branch circuit protection requirements. Refer to the information that is provided with your device for electrical specifications.

WARNING: Handling the cord on this product or cords associated with accessories sold with this product, will expose you to lead, a chemical known to the State of California to cause cancer, and birth defects or other reproductive harm. *Wash hands after handling.*

ADVERTENCIA: El contacto con el cable de este producto o con cables de accesorios que se venden junto con este producto, pueden exponerle al plomo, un elemento químico que en el estado de California de los Estados Unidos está considerado como un causante de cancer y de defectos congénitos, además de otros riesgos reproductivos. *Lávese las manos después de usar el producto.*

Chapter 1. The IBM BladeCenter Layer 2-7 GbE Switch Module

This *Installation Guide* contains information about installing, and configuring your IBM® BladeCenter® Layer 2-7 GbE Switch Module.

For installation details, see Chapter 2, “Installing and removing a switch module,” on page 11. For additional information, see the instructions in your BladeCenter documentation. The IBM BladeCenter Layer 2-7 GbE Switch Module is also referred to throughout this document as the GbE switch module. All IBM BladeCenter unit types are referred to throughout this document as the BladeCenter unit.

Your GbE switch module is one of the I/O modules that can be installed in a BladeCenter unit. See the documentation for your BladeCenter unit type for specific I/O module installation requirements.

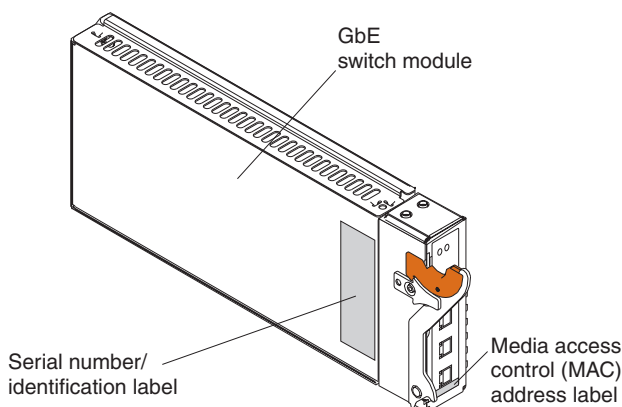
You can obtain up-to-date information about your BladeCenter GbE switch module and other IBM server products at <http://www-947.ibm.com/support/entry/portal/documentation/>.

Notes:

1. The illustrations in this document might differ slightly from your hardware.
2. The sample screens that appear in this document might differ slightly from the screens displayed by your system. Screen content varies based on the type of BladeCenter unit that you are using and the firmware versions and options that are installed.

The product name and serial number are located on the identification label on the side of the GbE switch module. You will need this information when you register your GbE switch module with IBM. The media access control (MAC) address is located on a separate label on the information panel under the external Ethernet port connectors.

See the following illustration for the locations of the identification label and the MAC address label.



Record your product information in this table.

Product name	IBM BladeCenter Layer 2-7 GbE Switch Module
Serial number	_____
Media access control (MAC) address	_____

Related documentation

This *Installation Guide* contains setup and installation instructions for the GbE switch module. This document also provides general information about your GbE switch module including how to get help. The most recent versions of this *Installation Guide* and all other BladeCenter documentation are at <http://www-947.ibm.com/support/entry/portal/documentation/>, enter the name of your product in the **Quick Find** field and press **Enter**. Also, some hardcopy documents are available through the IBM Publications Center at <http://www.elink.ibm.link.ibm.com/public/applications/publications/cgibin/pbi.cgi>

In addition to this *Installation Guide*, the following related documentation is available for your GbE switch module:

- *Systems Safety Notices*

This document contains translated caution and danger statements. Each caution and danger statement that appears in the documentation has a number that you can use to locate the corresponding statement in your language in the *Systems Safety Notices* document. This document is available on the IBM *Documentation* CD that comes with your product.

- *Hardware Maintenance Manual and Troubleshooting Guides*

Selected BladeCenter products have a customized *Hardware Maintenance Manual and Troubleshooting Guide*. These documents contain information to help you solve a problem yourself or to provide helpful information to a service technician.

- *Application Guide for IBM BladeCenter Layer 2-7 GbE Switch Module*

This IBM BladeCenter document contains detailed setup and installation instructions for the GbE switch module. It provides:

- Configuration instructions for your GbE switch module
- Information about features
- Information about getting help
- Guidance for planning, implementing, and administering LAN operating system (LAN OS) software
- Usage examples
- Troubleshooting information for your GbE switch module

- *Browser-Based Interface Quick Guide for IBM BladeCenter Layer 2-7 GbE Switch Module*

This document contains information about the browser-based interface that you can use to:

- Access switch information
- Calculate and obtain statistical data
- Perform switch configuration

- *Command Reference for IBM BladeCenter Layer 2-7 GbE Switch Module*

This IBM BladeCenter document includes:

- Information about getting started
- Information about first-time connection to the GbE switch module
- Telnet program interface requirements
- Browser-based network interface requirements
- Command Line Interface (CLI) operations
- Maintenance menus
- Statistics
- Supported SNMP MIBs
- Syslog messages
- Usage examples

Additional documents on the IBM BladeCenter *Documentation* CD include the License Agreement for Machine Code (LAMC).

In addition to the documentation in this library, be sure to review the following information:

- *BladeCenter Management Module Command-Line Interface Reference Guide*

This document explains how to use the management-module CLI to directly access BladeCenter management functions as an alternative to using the Web-based user interface. The CLI also provides access to the text-console command prompt on each blade server through a serial over LAN (SOL) connection. This information is available at <http://publib.boulder.ibm.com/infocenter/bladectr/documentation/index.jsp>.

- *BladeCenter Management Module User's Guide*

This document provides general information about the management module for your BladeCenter type, including information about features, how to configure the management module, and how to get help. This information is available at <http://publib.boulder.ibm.com/infocenter/bladectr/documentation/index.jsp>.

- *Command-Line Interface Reference Guide* for your BladeCenter unit type

This document provides to help you prepare for system installation, software updates, and configuration. This document is available at <http://www-947.ibm.com/support/entry/portal/docdisplay?lnocid=MIGR-54667>.

You might need to install an I/O expansion card (also known as an Ethernet expansion card) on some blade servers when installing the GbE switch module into certain I/O-module bays of the xSeries® unit. For information about the types of compatible I/O expansion cards for the blade servers, contact your IBM authorized reseller. See the I/O expansion card documentation for details about I/O expansion card installation, configuration, and use.

Specifications and features

This section provides a summary of the specifications and features for your IBM BladeCenter Layer 2-7 GbE Switch Module. For detailed information about the features, see the *Application Guide* for your switch.

The IBM BladeCenter Layer 2-7 GbE Switch Module has the following features:

- Ports
 - Four external 1000BASE-T connectors for making 10/100/1000 Mbps connections to a backbone, end stations, and servers
 - Fourteen internal full-duplex gigabit ports, one connected to each of the blade servers in the BladeCenter unit
 - Two internal full-duplex 10/100 Mbps ports connected to the management module
 - One RS-232 console port that provides an additional means to install software and configure the switch module

- Performance features
 - 64 real servers and 256 real services
 - 64 virtual servers and 256 virtual services
 - 128 Internet protocol (IP) interfaces
 - 128 static route entries
 - 1024 total policy filters
 - 2048 dynamic route entries
 - 2048 forwarding database (FDB) entries
 - 4096 address resolution protocol (ARP) entries
 - Layer 2 through Layer 7 (L2-L7) support
 - 300 000 simultaneous Layer 2 through Layer 7 (L2-L7) sessions
 - 802.1D spanning tree support; can be disabled on the entire switch or on a per-port basis
 - Support for 16 multiple spanning tree groups
 - 802.1Q tagged virtual local area network (VLAN) support
 - Support for 128 VLANs
 - Denial-of-Service protection
 - Forwarding table age time: maximum 1 to 65535 seconds. The default is 300 seconds
 - Content-based load balancing
 - Hypertext transfer protocol (HTTP)
 - Real time streaming protocol (RTSP)
 - Domain name system (DNS)
 - Layer 4 load balancing
 - HTTP cookie and secure sockets layer (SSL) session ID persistency
 - Link aggregation with 802.3 support on four external ports for up to two trunk groups
 - Media access control (MAC) address learning: Automatic update. Supports 2048 MAC addresses
 - Packet forwarding rate:
 - Full-wire speed for all connections. 148800 packets per second (pps) per port (for 100 Mbps)
 - 1488100 pps per port (for 1000 Mbps)
 - Random-access memory (RAM) buffer: 128 MB
 - Real server health checking
 - High availability Modes
 - Active - Standby
 - Active - Active

- Hot Standby
- Trunk Failover
- L2 trunk fail over with virtual router redundancy protocol (VRRP)
- Server processing on external ports
- 32-bit minmisses server load balancing metric
- Support for two network time protocol (NTP) time servers
- Support for terminal access controller access control system (TACACS+)
- Support for Internet group management protocol (IGMP) v1 and v2 snooping
- Routing Information Protocol version 1 (RIP V1), Border Gateway Protocol version 4 (BGP V4), and Open Shortest Path First version 2 (OSPF V2)
- Transmission method: Store-and-forward
- Management
 - Spanning Tree Protocol (STP) for creation of alternative backup paths and prevention of network loops.
 - Fast port forward
 - Fast uplink convergence
 - Simple Network Management Protocol (SNMP) Version 1
 - Fully configurable either in-band or out-of-band control through SNMP-based software.
 - Flash memory for software upgrades. This can be done through Trivial File Transfer Protocol (TFTP) or Hypertext Transfer Protocol (HTTP) Web interface
 - Built-in SNMP management:
 - Bridge management information base (MIB) (RFC 1493)
 - MIB-II (RFC 1213)
 - 802.1P/Q MIB (RFC 2674)
 - Interface MIB (RFC 2233)
 - Browser-based management support
 - TFTP support
 - Bootstrap protocol (BOOTP) support
 - Dynamic Host Configuration Protocol (DHCP) client support
 - Password enabled
 - Telnet remote-control console

You can also manage the switch by using a Simple Network Management Protocol (SNMP) version 1 interface, as described in the *Application Guide* for your switch module. The SNMP interface supports the following Internet standards:

- RFC 1155, Structure and identification of management information for TCP/IP-based internets, M. T. Rose, K. McCloghrie. May-01-1990
- RFC 1157, Simple Network Management Protocol (SNMP). J.D. Case, M. Fedor, M. L. Schoffstall, C. Davin. May-01-1990
- RFC 1212, Concise MIB definitions. M. T. Rose, K. McCloghrie. Mar-01-1991
- RFC 1213, Management Information Base for Network Management of TCP/IP-based internets: MIB-II. K. McCloghrie, M. T. Rose. Mar-01-1991
- RFC 1493, Definitions of Managed Objects for Bridges. E. Decker, P. Langille, A. Rijsinghani, K. McCloghrie. July 1993
- RFC 1573, Evolution of the Interfaces Group of MIB-II. K. McCloghrie, F. Kastenholz. January 1994
- RFC 1643, Definitions of Managed Objects for the Ethernet-like Interface Types. F. Kastenholz. July 1994
- RFC 1657, Definitions of Managed Objects for the Fourth Version of the Border Gateway Protocol (BGP-4) using SMIv2. S. Willis, J. Burruss, J. Chu, Ed. July 1994
- RFC 1724, RIP Version 2 MIB Extension. G. Malkin, F. Baker. November 1994
- RFC 1757, Remote Network Monitoring Management Information Base. S. Waldbusser. February 1995
- RFC 1850, OSPF Version 2 Management Information Base. F. Baker, R. Coltun. November 1995
- RFC 2021, Remote Network Monitoring Management Information Base Version 2 using SMIv2. S. Waldbusser. January 1997 (partial support)
- RFC 2037, Entity MIB using SMIv2. K. McCloghrie, A. Bierman. October 1996 (partial support)
- Network cables:

Note: To make sure that the BladeCenter unit installation complies with electromagnetic compatibility (EMC) product regulations for intra-building lightning surges, you must use shielded LAN cables that are grounded at both ends.

- 10BASE-T:
 - UTP Category 3, 4, 5 (100 meters maximum)
 - 100-ohm STP (100 meters maximum)
- 100BASE-TX:
 - UTP Category 5 (100 meters maximum)
 - EIA/TIA-568 100-ohm STP (100 meters maximum)
- 1000BASE-T:
 - UTP Category 6 (standard for 1 GB devices)

- UTP Category 5e (100 meters maximum)
 - UTP Category 5 (100 meters maximum)
 - EIA/TIA-568B 100-ohm STP (100 meters maximum)
- RS-232 serial cable:
 - 3 meter console cable DB-9 to 8 pin DIN

Standards

The GbE switch module supports the following standards:

- IEEE standards
 - IEEE 802.1d Spanning Tree Protocol
 - IEEE 802.1P Tagged Packets
 - IEEE 802.1Q Tagged VLAN (frame tagging on all ports when VLANs are enabled)
 - IEEE 802.2 Logical Link Control
 - IEEE 802.3 10BASE-T Ethernet
 - IEEE 802.3u 100BASE-TX Fast Ethernet
 - IEEE 802.3x Full-duplex Flow Control
 - IEEE 802.3z
 - 1000BASE-SX Gigabit Ethernet
 - Link Negotiation

Notices and statements used in this book

The caution and danger statements that appear in this document are also in the multilingual *Systems Safety Notices* document, which is on the IBM BladeCenter *Documentation* CD. Each statement is numbered for reference to the corresponding statement in the *Systems Safety Notices* document.

The following types of notices and statements are used in this document:

- **Note:** These notices provide important tips, guidance, or advice.
- **Important:** These notices provide information or advice that might help you avoid inconvenient or problem situations.
- **Attention:** These notices indicate possible damage to programs, devices, or data. An attention notice is placed just before the instruction or situation in which damage could occur.
- **Caution:** These statements indicate situations that can be potentially hazardous to you. A caution statement is placed just before the description of a potentially hazardous procedure step or situation.

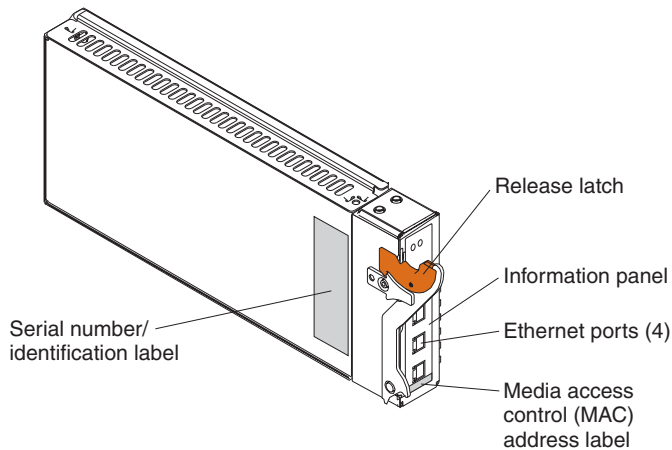
- **Danger:** These statements indicate situations that can be potentially lethal or extremely hazardous to you. A danger statement is placed just before the description of a potentially lethal or extremely hazardous procedure step or situation.

Major components of the GbE switch module

The orange color on the release latch on your GbE switch module identifies this device as a hot-swap component. You can install or remove this component while the BladeCenter unit is running.

The following illustration shows the major components of your GbE switch module.

Note: The illustrations in this document might differ slightly from your hardware.



For more information about the components of the information panel, see Chapter 4, “Information panel LEDs and external ports,” on page 21. For more information about the MAC address, see the *Application Guide* for your switch module at <http://www-947.ibm.com/support/entry/portal/>.

Chapter 2. Installing and removing a switch module

See the *Installation and User's Guide* for your BladeCenter unit type for information about the I/O-module bay locations in the BladeCenter unit and specific requirements for installing I/O modules in your BladeCenter unit.

Attention: To maintain proper system cooling, each I/O-module bay must contain either an I/O module or a filler module; each blade bay must contain either a blade server or a filler blade.

Your BladeCenter unit supports a minimum of one hot-plug GbE switch module, in I/O-module bay 1. The GbE switch modules in I/O-module bays 1 and 2 are for the integrated Ethernet controllers in the applicable blade server. You might need to install GbE switch modules in other I/O-module bays of the BladeCenter unit when additional Ethernet controllers are installed or activated on a blade server.

For details about network interface requirements and expansion options, see the following books:

- *Planning and Installation Guide* for your BladeCenter unit type
- *Installation and User's Guide* for your BladeCenter unit type
- *Installation and User's Guide* for each blade server type

Installation guidelines

Before you begin to install the GbE switch module in your BladeCenter unit, read the following information:

- Read the safety information beginning on page v and the guidelines in "Handling static-sensitive devices" on page 12, and read the safety statements in the BladeCenter unit publications.
- The orange color on the release latch on your GbE switch module identifies this device as a hot-swap component. You can install or remove this component while the BladeCenter unit is on. See the instructions in this chapter for more information about installing or removing hot-swap or hot-plug components.
- You do not need to turn off the BladeCenter unit to install or replace any of the hot-swap modules in the BladeCenter unit.
- If you plan to install additional GbE switch modules in the I/O-module bays of your BladeCenter unit, you might also need to install an I/O expansion card in the applicable blade server to support the GbE switch modules in these bays.

System reliability considerations

To help ensure proper cooling and system reliability, make sure that:

- Each of the I/O-module bays in the BladeCenter unit has either an I/O module or filler module installed.
- A removed hot-swap module is replaced with another module or filler module within 1 minute of removal.
- A removed hot-swap blade server is replaced with another blade server or filler blade within 1 minute of removal.
- Cables for the GbE switch module are routed according to the illustrations and instructions in this book.

Handling static-sensitive devices

Attention: Static electricity can damage electronic devices and your system. To avoid damage, keep static-sensitive devices in their static-protective packages until you are ready to install them.

To reduce the possibility of electrostatic discharge, observe the following precautions:

- Limit your movement. Movement can cause static electricity to build up around you.
- Handle the device carefully, holding it by its edges or its frame.
- Do not touch solder joints, pins, or exposed printed circuitry.
- Do not leave the device where others can handle and damage it.
- While the device is still in its static-protective package, touch it to any *unpainted* metal surface of the BladeCenter unit or any *unpainted* metal surface on any other grounded rack component for at least 2 seconds. (This drains static electricity from the package and from your body.)
- Remove the device from its package and install it directly into your BladeCenter unit without setting it down. If it is necessary to set down the device, put it back into its static-protective package. Do not place the device on your BladeCenter chassis or on a metal surface.
- Take additional care when handling devices during cold weather. Heating reduces indoor humidity and increases static electricity.

Installing a switch module

Statement 8:



CAUTION:

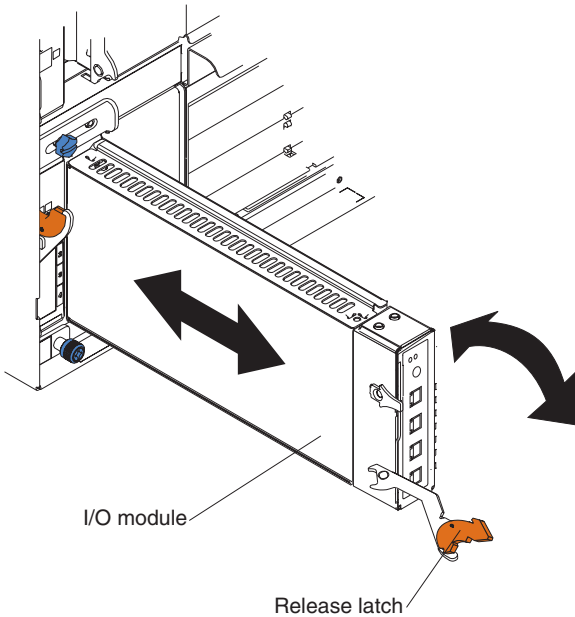
Never remove the cover on a power supply or any part that has the following label attached.



Hazardous voltage, current, and energy levels are present inside any component that has this label attached. There are no serviceable parts inside these components. If you suspect a problem with one of these parts, contact a service technician.

The following illustration shows how to install an I/O module in a typical BladeCenter unit.

Note: The illustrations in this document might differ slightly from your hardware.



Complete the following steps to install an I/O module:

1. Read the safety information beginning on page v and “Installation guidelines” on page 11.

2. If an acoustic attenuation module is installed on your BladeCenter unit, remove it. See the documentation for your BladeCenter unit for instructions.
3. Select an I/O-module bay in which to install the GbE switch module.

Note: For details about I/O-module bay requirements, see the documentation for your BladeCenter unit type and blade servers.

4. Remove the filler module from the selected I/O module bay. Store the filler module for future use.
5. If you have not already done so, touch the static-protective package that contains the switch module to any *unpainted* metal surface of the BladeCenter unit or any *unpainted* metal surface on any other grounded rack component for at least 2 seconds.
6. Remove the switch module from its static-protective package.
7. Ensure that the release latch on the switch module is in the open position (perpendicular to the module).
8. Slide the switch module into the applicable I/O-module bay until it stops.
9. Push the release latch on the front of the switch module to the closed position. After you insert and lock the switch module, it is turned on, and a power-on self-test (POST) occurs to verify that the switch module is operating correctly.
10. The POST results are displayed by the status LEDs. Make sure that the LEDs on the switch module indicate that it is operating correctly. Make sure that the OK LED on each switch module is lit. See Chapter 4, “Information panel LEDs and external ports,” on page 21 for a more detailed description of the operation of these LEDs.

For additional information, see Chapter 5, “Solving problems,” on page 25.

11. If you have other switch modules to install, do so now; otherwise, go to step 12.

Note: To make sure that the BladeCenter unit installation complies with EMC product regulations for intra-building lightning surges, you must use shielded LAN cables that are grounded at both ends.

12. Attach any cables or cords required by the switch module. For the location of the connectors on the BladeCenter unit, see the *Installation and User's Guide* for your BladeCenter unit type. For cable requirements, see page 7.
13. Replace the acoustic attenuation module, if you removed it in step 2.

Removing a switch module

Attention: To maintain proper cooling and system reliability, each I/O-module bay in the BladeCenter unit must have either an I/O module or filler module installed. If you remove a hot-swap module, you must replace it with another module or filler module within 1 minute of removal.

Statement 8:



CAUTION:

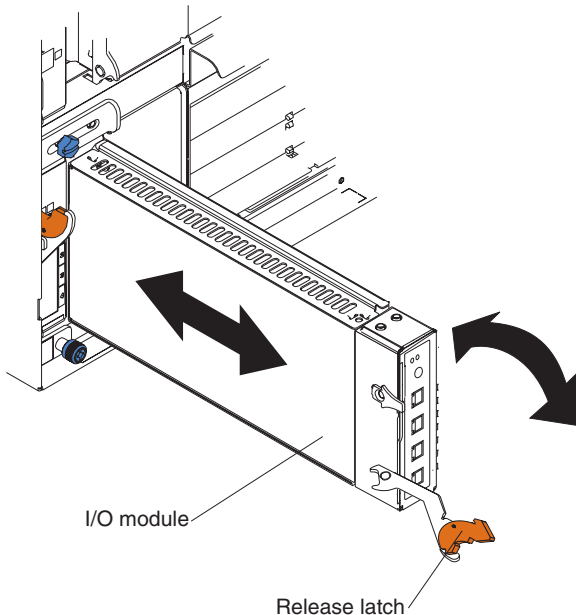
Never remove the cover on a power supply or any part that has the following label attached.



Hazardous voltage, current, and energy levels are present inside any component that has this label attached. There are no serviceable parts inside these components. If you suspect a problem with one of these parts, contact a service technician.

To remove a switch module, complete the following steps:

1. Read the safety information beginning on page v and “Installation guidelines” on page 11.
2. If an acoustic attenuation module is installed on your BladeCenter unit, remove it. See the documentation for your BladeCenter unit for instructions.
3. Disconnect any cables from the switch module that you are removing.
4. Pull the release latch toward the bottom of the switch module as shown in the following illustration. The module moves out of the I/O module bay approximately 0.64 cm (0.25 inch).



5. Slide the switch module out of the I/O-module bay and set it aside.
6. Place either another switch module or a filler module in the I/O-module bay within 1 minute.
7. If you placed another switch module in the I/O-module bay, reconnect any cables that you disconnected in step 3.
8. Replace the acoustic attenuation module option, if you removed it in step 2.

Chapter 3. Updating the software and configuring the switch module

Make sure that you are using the latest version of management module firmware for your BladeCenter unit type. See the *IBM BladeCenter Management Module User's Guide* for your BladeCenter unit type, located at <http://publib.boulder.ibm.com/infocenter/bladectr/documentation/index.jsp> for your BladeCenter unit type for additional information.

Make sure that you are using the latest version of the switch module software. For instructions on upgrading the switch module software, see the *IBM BladeCenter CLI Reference Guide* at <http://www-947.ibm.com/support/entry/portal/docdisplay?lnodocid=MIGR-54667>.

For instructions on configuring the switch module, see the *IBM BladeCenter Command Reference Guide* for your switch module information located at <http://www.bladenetwork.net/IBM-BladeCenter-support.html>.

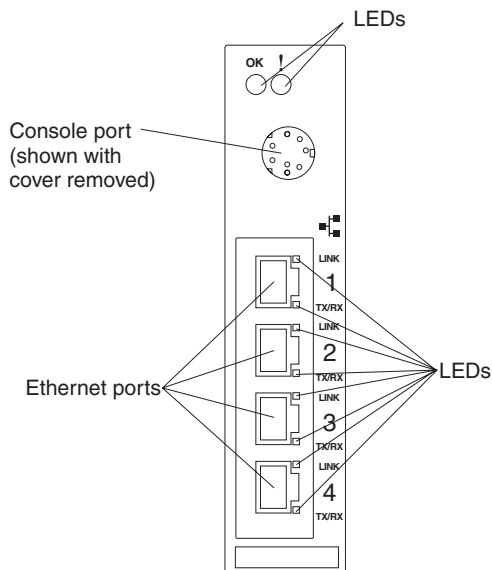
Chapter 4. Information panel LEDs and external ports

This chapter describes the information panel and LEDs on the GbE switch module. This chapter also identifies the external ports on the information panel.

Information panel

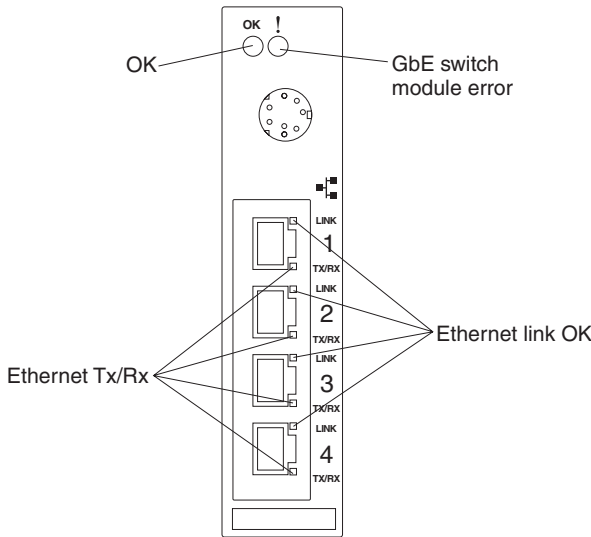
As shown in the following illustration, the information panel of the GbE switch module contains:

- The LEDs that display the status of the GbE switch module and the network (see “LEDs” on page 22).
- One RS-232 console port that provides an additional means to install software and configure the switch module. This 8-pin DIN connector allows connection of an 8-pin DIN to DB9 serial cable. A protective cap must be removed while the console port is in use and should be reinstalled when the console cable is disconnected.
- Four external 1000BASE-T Ethernet ports for 10/100/1000 Mbps connections to external Ethernet devices, such as backbones, end stations, and servers. These ports are respectively identified as EXT1, EXT2, EXT3, and EXT4 in the switch configuration menus and are labeled 1 through 4 (from top to bottom) on the GbE switch module.



LEDs

The LEDs on the information panel of the GbE switch module are OK and GbE switch module error (fault). In addition, each external port on the GbE switch module contains an Ethernet link OK LED and an Ethernet Tx/Rx LED. The following illustration shows the LEDs on the GbE switch module. A description of each LED follows the illustration.



Note: An amber LED is lit when a system error or event has occurred. To identify the error or event, check the LEDs on the information panel of the GbE switch module. For additional information, see Chapter 5, “Solving problems,” on page 25.

OK: This green LED is on the left side of the information panel, above the four external 10/100/1000 Mbps ports. When this LED is lit, it indicates that the GbE switch module has passed the power-on self-test (POST) with no critical faults and is operational.

GbE switch module error (fault): This amber LED is on the right side of the information panel, above the four external 10/100/1000 Mbps ports. When this LED is lit, it indicates that the GbE switch module has failed the POST or detected an operational fault.

Note: When the GbE switch module error LED is lit, the system-error LED on the BladeCenter unit will also be lit.

Ethernet link OK: This green link status LED is at the top of each external 10/100/1000 Mbps port. When this LED is lit on a port, it indicates that there is a connection (or link) to a device using that connector.

Ethernet Tx/Rx: This green activity LED is at the bottom of each external 10/100/1000 Mbps port. When this LED blinks on a port, it indicates that data is being transmitted or received (that is, activity is occurring) between that port and another device on the network link. The blink frequency is proportional to the amount of traffic on the network link.

Chapter 5. Solving problems

This section provides basic troubleshooting information to help you solve some problems that might occur while you are setting up the GbE switch module. The *Application Guide* contains more details about troubleshooting the GbE switch module.

If you cannot locate and correct the problem using the information in this section, see Appendix A, “Getting help and technical assistance,” on page 29.

Running POST

To ensure that it is fully operational, the GbE switch module processes a series of tests during power-up or a restart (power-on self-test or POST). These tests take approximately 1 minute to complete. The management module reads the test results and displays them for you. During normal operation, these tests are completed without error, and the green OK LED is lit. However, if POST fails, the amber GbE switch module error (fault) LED and the system-error LED on the BladeCenter unit will be lit. An event is stored in the event log in the System Status panel of the management module. The specific failure is displayed on the System Status I/O Module panel of the management module. The following illustrations are examples of the windows that will be displayed if a POST error occurs.

Note: For the location and description of the GbE switch module LEDs, see Chapter 4, “Information panel LEDs and external ports,” on page 21.

POST errors

There are two types of errors: noncritical and critical. Noncritical errors apply to one port, and the GbE switch module is operational. You can continue to operate the GbE switch module; however, you must replace it as soon as possible. When critical errors occur, the GbE switch module does not operate. If a critical error occurs, complete the following steps:

1. Open the Management Module Switch Information window.
2. Turn off the GbE switch module; then, turn it back on.
3. After POST is completed, the management module displays the results. Refresh the window to view the POST results. If the error remains, the GbE switch module is defective. Replace the GbE switch module.

The following table describes the basic critical and noncritical failures. This abbreviated list is representative; it is not intended as an exhaustive list. An error code is associated with each failure. Error codes appear on the

Management Module Switch Information window. Be sure to note the applicable error code and corresponding failure. You might need to provide this information when you call the IBM HelpCenter®. For more details, see Appendix A, “Getting help and technical assistance,” on page 29.

Diagnostic indicator (in hex)	Failing functional area	Failure criticality
00 - 7F	Base internal functions	Critical
80 - 9F	Internal interface failures	Noncritical
A0 - AF	External interface errors	Noncritical
B0 - FE	Reserved	Noncritical
FF	Switch module “good” indicator	Operation

Chapter 6. Parts listing

The following table shows the list of the parts that come with the switch module option. This parts listing supports the copper and fiber models of the IBM BladeCenter Layer 2/3 GbE Switch Module.

Option	FRU No.	CRU/FRU
GbE switch module assembly	32R1868	CRU
Serial Console Cable	26K6541	CRU

Appendix A. Getting help and technical assistance

If you need help, service, or technical assistance or just want more information about IBM products, you will find a wide variety of sources available from IBM to assist you. This appendix contains information about where to go for additional information about IBM and IBM products, what to do if you experience a problem with your BladeCenter product or optional device, and whom to call for service, if it is necessary.

Before you call

Before you call, make sure that you have taken these steps to try to solve the problem yourself:

- Check all cables to make sure that they are connected.
- Check the power switches to make sure that the system and any optional devices are turned on.
- Use the troubleshooting information in your system documentation, and use the diagnostic tools that come with your system. Information about diagnostic tools is in the *Hardware Maintenance Manual and Troubleshooting Guide* or *Problem Determination and Service Guide* on the IBM Documentation CD that comes with your BladeCenter unit.
- Go to <http://www-947.ibm.com/support/entry/portal/docdisplay?brand=5000008&Indocid=SERV-CALL> to check for information to help you solve the problem.

You can solve many problems without outside assistance by following the troubleshooting procedures that IBM provides in the online help or in the documentation that is provided with your IBM product. The documentation that comes with BladeCenter systems also describes the diagnostic tests that you can perform. Most BladeCenter systems, operating systems, and programs come with documentation that contains troubleshooting procedures and explanations of error messages and error codes. If you suspect a software problem, see the documentation for the software.

Using the documentation

Information about your IBM BladeCenter system and preinstalled software, if any, or optional device is available at <http://www-947.ibm.com/support/entry/portal/documentation/>. That documentation can include printed documents, online documents, readme files, and help files. for instructions for using the diagnostic programs.

Use the troubleshooting information in your system documentation, and use the diagnostic tools that come with your system. Information about diagnostic tools is in the *Hardware Maintenance Manual and Troubleshooting Guide* or *Problem Determination and Service Guide* on the IBM Documentation CD that comes with your BladeCenter unit. IBM maintains pages on the World Wide Web where you can get the latest technical information and download device drivers and updates. To access these pages, go to <http://www-947.ibm.com/supportportal>.

To access the latest documentation, go to <http://www-947.ibm.com/support/entry/portal/documentation/>, enter the name of your product in the **Quick Find** field and press **Enter**. Also, some hardcopy documents are available through the IBM Publications Center at <http://www.elink.ibm.link.ibm.com/public/applications/publications/cgibin/pbi.cgi>.

Getting help and information from the World Wide Web

Up-to-date information about IBM products and support is available on the World Wide Web at <http://www-947.ibm.com/supportportal/>.

Software service and support

Through IBM Support Line, you can get telephone assistance, for a fee, with usage, configuration, and software problems with BladeCenter products. For information about which products are supported by Support Line in your country or region, see <http://www.ibm.com/services/sl/products/>.

For more information about Support Line and other IBM services, see <http://www.ibm.com/services/supline/products/>, or see <http://www.ibm.com/planetwide/> for support telephone numbers. In the U.S. and Canada, call 1-800-IBM-SERV (1-800-426-7378).

Hardware service and support

You can receive hardware service through IBM Services or through your IBM reseller, if your reseller is authorized by IBM to provide warranty service. See <http://www.ibm.com/planetwide/> for support telephone numbers, or in the U.S. and Canada, call 1-800-IBM-SERV (1-800-426-7378).

In the U.S. and Canada, hardware service and support is available 24 hours a day, 7 days a week. In the U.K., these services are available Monday through Friday, from 9 a.m. to 6 p.m.

Appendix B. Notices

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Important notes

Processor speeds indicate the internal clock speed of the microprocessor; other factors also affect application performance.

CD drive speeds list the variable read rate. Actual speeds vary and are often less than the maximum possible.

When referring to processor storage, real and virtual storage, or channel volume, KB stands for approximately 1000 bytes, MB stands for approximately 1 000 000 bytes, and GB stands for approximately 1 000 000 000 bytes.

When referring to hard disk drive capacity or communications volume, MB stands for 1 000 000 bytes, and GB stands for 1 000 000 000 bytes. Total user-accessible capacity may vary depending on operating environments.

Maximum internal hard disk drive capacities assume the replacement of any standard hard disk drives and population of all hard disk drive bays with the largest currently supported drives available from IBM.

Maximum memory may require replacement of the standard memory with an optional memory module.

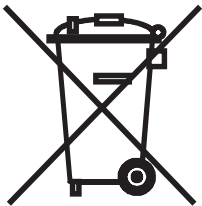
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Some software may differ from its retail version (if available), and may not include user manuals or all program functionality.

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This unit must be recycled or discarded according to applicable local and national regulations. IBM encourages owners of information technology (IT) equipment to responsibly recycle their equipment when it is no longer needed. IBM offers a variety of product return programs and services in several countries to assist equipment owners in recycling their IT products. Information on IBM product recycling offerings can be found on IBM's Internet site at <http://www.ibm.com/ibm/environment/products/prp.shtml>.



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This appliance is labeled in accordance with European Directive 2002/96/EC concerning waste electrical and electronic equipment (WEEE). The Directive determines the framework for the return and recycling of used appliances as applicable throughout the European Union. This label is applied to various

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注意: このマークは EU 諸国およびノルウェーにおいてのみ適用されます。

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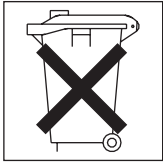
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This product may contain a sealed lead acid, nickel cadmium, nickel metal hydride, lithium, or lithium ion battery. Consult your user manual or service manual for specific battery information. The battery must be recycled or disposed of properly. Recycling facilities may not be available in your area. For information on disposal of batteries outside the United States, go to <http://www.ibm.com/ibm/environment/products/batteryrecycle.shtml> or contact your local waste disposal facility.

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Note: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his own expense.

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Avis de conformité à la réglementation d'Industrie Canada

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Notice to Customers

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を講ずるよう要求されることがあります。 VCCI-A

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